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an element
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ENVIRONMENTAL PLAN

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INTRODUCTION

During recent years, a growing interest in the preservation of natural resources has brought about a realization of the ramifications of unchecked abuse to natural resources. As an expression of this concern, the California Legislature, in 1970, required counties and cities to complete a Conservation Element as a part of their required General Plan. The element, as enacted into law, is designed to provide a guide for the conservation, development and utilization of natural resources within a local government's planning area. Included within the scope of this legislation are the following natural resources; water and its hydraulic force, wooded areas, soils, rivers, harbours, fisheries, wildlife, minerals and other natural resources.

In addition, the plan may include provisions for the reclamation of land and water, flood control, preservation and control of pollution of watercourses, regulation of the land and stream channels, and other areas required for the accomplishment of the plan, as well as to preserve, control and correct erosion of soils, beaches and shores, protect watersheds, control the location, quantity and quality of rocks, sand and gravel resources.

The extent to which the above categories may or may not apply is explored in the following Conservation Element. Although Pleasant Hill has many concerns in the aspect of future growth, the City's environmental concerns are not of as grave concern as are those of many other American cities, in that Pleasant Hill does not have any mines, gravel pits, oil drilling or any other constant industrial depletion of its dominion.

Instead, Pleasant Hill has the problems of orderly development in harmony with the health, safety and welfare of its constituents. In reading the following document, one will become aware of the many environmental concerns related to the City of Pleasant Hill. Many that are not dealt with here will be covered in the Open Space, Noise, Transportation and Seismic Safety Elements.

CONSERVATION AND PLANNING

It is apparent that conservation and planning can not be approached in isolation from each other. A growing public diligence has emerged concerning the inter-relationships between many factors; depletion of open space reserves, pollution, land use, urban growth policies and natural resources among some. In relation to these public concerns, the City Government of Pleasant Hill will utilize the concepts of the General Plan as an instrument of public policy, by which interpretations may be made

in reference to these issues.

This plan has been designed to meet the City's conservation needs for years to come. It thus may be considered, in part, a mechanism to control future development. In years to come, should any great changes in population or economics occur, a review of these policies may become necessary and some areas herein may be added to, deleted from, or amended.

INTENT AND MEANS

1. INTENT: To enhance and protect the City's wildlife, recreational and natural resources, so as to improve the quality of life and aesthetics of the community as a whole.

Means:

- a. Evaluate all feasible ecological and aesthetic ramifications of new development prior to issuance of a Building Permit.
- b. Advise and recommend as to the maintenance of wildlife and aesthetics whenever and wherever possible, without infringing upon development rights.
- c. Improve and augment appropriate and exacting methods of protecting Pleasant Hill's natural amenities.
- d. Review and revise the Hillside Development Policy to provide more rigid controls and performance standards, as well as inclusion of ridgeline control provisions.

2. INTENT: Apply adequate and well-informed decision-making processes to the planning process.

Means:

- a. Sound and thorough review, evaluation and perhaps re-evaluation of certain open space parcels throughout the City.
- b. Rezoning, where deemed necessary.

3. INTENT: When ecological damage may be irreversible, provide proper means of prevention.

Means:

- a. In situations where development would prove incongruent with ecological principles, arrange for proper mitigation.

EFFECTS OF URBAN EXPANSION ON CONSERVATION

Urban sprawl and the desire for better living conditions has never been more evident than in the State of California. Contra Costa County and the City of Pleasant Hill have not at all been immune to increasing urbanization. Much of the once agricultural Diablo Valley bottomland is now covered with various buildings of all shapes, sizes and uses.

Since the early 1960's, the County's population has seen a shift in urbanization from the overcrowded cities into the suburbs. New cities, in light of new concepts, have had little influence in the matter by which they expand. Generally, urbanization has been unplanned and where "concepts" have existed, they have had little effect upon actual growth. It is true that some cities may be referred to as "planned" by virtue of the fact that they have been surveyed and layed out, but their eventual development plans were not a product of comprehensive land use planning.

For the most part, the consumption of land for development has been the product of the sum of small additions on a lot-by-lot basis, or where the demand warranted, on a subdivision-by-subdivision basis. Market characteristics dictate the manner in which most American urban development takes place.

One of the major criticisms of these developmental patterns has been the concern for its absorption of the fixed supply of land. Concern over this fixed public asset has been voiced from all quarters ranging from conservation groups to land developers, resulting in the identification of numerous causes, points of view and solutions. It quickly became clear that restrictions and controls had to be levied in order to accommodate more orderly expansion. The State of California, in essence, believes that where environmental ramifications are too severe to compromise for the worth of a development, such land should remain undeveloped.

The cities have many ways in which to approach conservation planning in their communities:

- 1) down-zoning (reduction of number of units allowable per acre);
- 2) fee title or purchase; and
- 3) preservation of endangered areas.

The range of choices for growth can go from completely unchecked to being serverely restricted. The choices are up to the respective governing bodies. The following document is a brief statement of Pleasant Hill's future intent to keep its growth in an orderly fashion with its environment.

It is clear that the trees, pastures and valleys, which were an undeveloped Pleasant Hill 15 years ago, are quickly disappearing to be replaced by urban development. A balance between man and nature has to be struck that is deleterious to neither and beneficial to both.

ISSUES

Conservation Problems: Retention of Undeveloped Land:

Pleasant Hill, in its suburban setting, has many conservation problems allied to its present and future development. As the population of Pleasant Hill and surrounding cities in Contra Costa County increases, pressures to develop wilderness and open space will undoubtedly increase. With all related conditions and pressures prevalent, one huge problem remains; retention of undeveloped land.

DEVELOPMENT PROBLEMS - ALLEVIATION

In 1973, the City developed its Open Space Element of the General Plan which specifies means by which the City may retain open space in accordance to needs of an expanding population. Previously, in June of 1969, the City Council of the City of Pleasant Hill adopted the Pleasant Hill Hillside Policy, which is directly aimed at retention of scenic corridors and irreplaceable visual amenities.

The General Plan, which is a statement of intent for the future development of the City, is concerned, not only with the immediate conservation problems of wilderness areas, but also with related factors which directly affect open space retention, such as density, increased or decreased zoning, retention of scenic corridors, etc. The Conservation Element deals with one view of these issues. The other elements, specifically are:

- 1) Open Space and Scenic Highways;
- 2) Seismic Safety;
- 3) Parks & Recreation;
- 4) Public Facilities;
- 5) Housing Policies;
- 6) Residential Development; and
- 7) Noise

They are all interrelated to the retention of land for properly planned use in years to come.

Much of the wilderness in and around Pleasant Hill will eventually be developed and the conservation concerns in these areas are many. In order to retain the natural amenities which exist, in the fashion which nature designed them, the Conservation Element will concern itself with the following issues:

WATER QUALITY

The General Plan is concerned with two basic ramifications of water as it applies to the planning process; water quality, and water run-off (rain), as it applies to siltation. In many cases, the entire mitigation of adverse effects is not possible, but through proper planning procedures, such negative ramifications may be kept at a minimum. In certain areas of Pleasant Hill, pollutants find their way into streams and waterways. Grayson Creek, the major recipient of street, parking lot and ground water run-off, invariably shows signs of pollution ranging from nitrates to tree stumps.

When the ground water run-off system for Pleasant Hill was originally designed, its ecological ramifications were not foreseen as pollution, but as a "price you pay for progress". Inadvertent as such oversights were, especially in light of what is known today to be true of the life-cycle destructive properties of fertilizers, pesticides and petroleum distillates, Pleasant Hill may now have to retain its present water run-off system into Grayson Creek. The possibility of filtering the run-off water before it enters into the creek was investigated. The cost of installation alone, not including necessary maintenance, was estimated at one and one-half million dollars. Simple cost/benefit analysis dictates that Pleasant Hill could get more conservation mileage for the tax dollar by installation of such a new expensive system to augment the old inefficient one. This, by no means, precludes that the City has to be content with future additional drainage resulting in run-off from new development. With today's technical knowledge available, the mistakes of the past need not necessarily occur again.

Today, the Resources Agency of the California Department of Fish and Game is responsible for the enforcement of Sections 5650 through 5652 of the Fish and Game Code which specifically prohibits water pollution, providing offenders with jail terms and/or fines. One of the main problems in such enforcement, is a lack of proper funding to enforce such laws. For the entire County of Contra Costa, only one man handles complaints of pollution or dead fish. No regular monitoring of streams occurs, and testing is done only when pollution is suspected.

Pollution of surface waters is primarily caused by pesticides and fertilizers which are carried by run-off into area streams to the Suisun Bay and eventually into the ocean. Pesticides kill much of the wildlife in and around the streams, while the nutrients from fertilizers cause oxygen-choking algae to flourish, deadening a stream's life processes. Stricter controls and better labeling instructions for marketing of pesticides and fertilizers, especially DDT, would be of great significance in alleviating the problem. Such controls, though, have to be levied at the federal or state level. At the local level, an education program, to make the public more aware of the unwanted side effects of fertilizers and pesticides to maintain their gardens, lawns and trees, could help to improve present circumstances.

The supply of drinking water (also used for washing machines, watering gardens, bathing, filling swimming pools, etc.) is dependent upon three separate water districts, which serve the Pleasant Hill Planning Area; the Contra Costa County

Water District, the East Bay Municipal Utility District, and the Gregory Gardens Water District. These districts all receive regular up-dating material advising them as to the number of building permits issued within their jurisdictions. Most new developments in Pleasant Hill have to provide their own water and sewage connections to link up with presently existing systems. This is the responsibility of the developer at the time of his application for a building permit.

The Central Sanitary District, the only sewer district serving Pleasant Hill, is presently expanding their facilities to accommodate the county's expanding population. In some places in Pleasant Hill and its ultimate boundaries, septic tanks and wells exist that are not connected with the three water utilities and the sanitary district. The reason that these conditions exist is the lack of near-by public water and sewage facilities at the time of development. Previous to building permits being issued for sites requesting wells or septic tanks, the proposed site drain fields, leach lines and all peripherals must be checked by the Health Department to insure clean drinking water and safe ground conditions for septic tanks. Once a septic tank visibly erupts or malfunctions or causes other unsafe or undesired conditions, the home owner is strongly urged to connect to public sewage facilities, if the conditions cannot be corrected.

CONSTRUCTION AND RELATED HYDROLOGICAL PROBLEMS

Examples From a Leading Survey:

Siltation fills the streams, raising the height of the stream beds, which inevitably results in impeding streamflow and causes additional water runoff and vegetation problems. The problems connected with the disturbance of natural ground cover manifest themselves most vividly after a good rainfall. Most people have seen sedimentation flows (erosion) at one time or another. Areas under construction yield the best examples of this sedimentation flow. J. M. Knott, the hydrologist, who wrote the Colma Creek Basin Sedimentation Study said: "any changes in the landscape can have some effect on the natural processes. . . , and erosion, sedimentation and flood levels can be especially susceptible to such changes."¹

With construction-exposed soil, (natural ground cover having been removed) sedimentation will increase as much as 85 times the rate under natural conditions.² In the Colma Creek Study, which was done over a period of 8 years,

1. News Release for Sediment Yields in the Colma Creek Basin Affected by Urban Development, a Study done by the United States Geological Survey Department of the Interior. Release dated May 31, 1973. (Colma Creek is in the rapidly developing area outside of Daly City)
2. *ibid*

standard measurements on streams in the basin were used to give objective overviews of this problem. In 1967, a very wet year in the Colma Creek Basin, the sedimentation yield at the Colma Creek gaging station was 14,000 tons per square mile, as compared to sedimentation yield of from 450 to 2,300 tons per square mile for several streams that drain undeveloped areas in the Bay Region.³ Since the early development of the Colma Creek Basin, the frequency of flooding there has increased. Large quantities of sediment have been eroded from the highlands and deposited along flat reaches of the stream channel.

HYDROLOGY AND DEVELOPMENT IN PLEASANT HILL

In 1972, the total precipitation in Pleasant Hill was 14.24 inches.⁴ Much of this water is shed down the eastern slopes of the briones foothills and is eventually channeled into Grayson and Walnut Creeks. (See Hydrological Cycle, Open Space Element, pages 22 and 23). Climatologically, Pleasant Hill's rainfall region is the Pacific Coast, north of about 37° north latitude and it includes the great valley of California and the western slopes of the Sierra Nevada. The entire area is typified by a majority of its rain falling in the winter, with annual amounts being small, accompanied by distinctly dry periods of from two to four months in the summer. The rainfall here is due mainly to Pacific Cyclones which drift eastward in low latitudes during the cold season.⁵ Therefore, hillside development is restricted to the summer months.

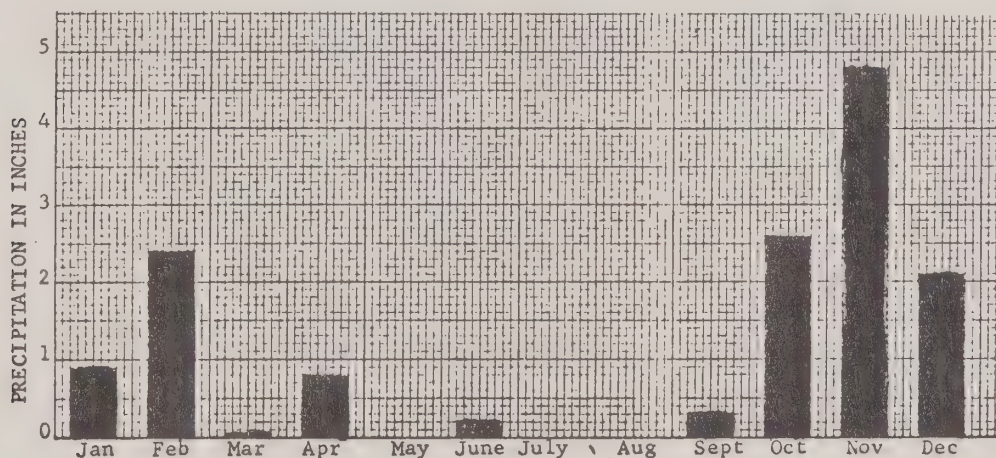


Table 1. Average Monthly Rainfall in Pleasant Hill

3. ibid - Because only part of the Colma Creek Basin was urbanized, it was possible to compare the amount of sediment being eroded from areas of contrasting land use. Knott found that urbanized areas produced about twice the sediment yields as undeveloped open space areas: Agricultural areas were about 65 times as much and areas under construction produced 85 times as much sediment yield (erosion) as open space lands. In 1970, the total sediment yield for the basin decreased significantly as the affect of reduced construction activity.
4. Climatological Data, U.S. Department of Commerce, National Oceanographic and Atmospheric Administration Environment Data Service, California Annual Summary of 1972. Readings taken from Walnut Creek.
5. Introduction of Meteorology, Sverre Pettersen, PhD. McGraw-Hill, 1969.

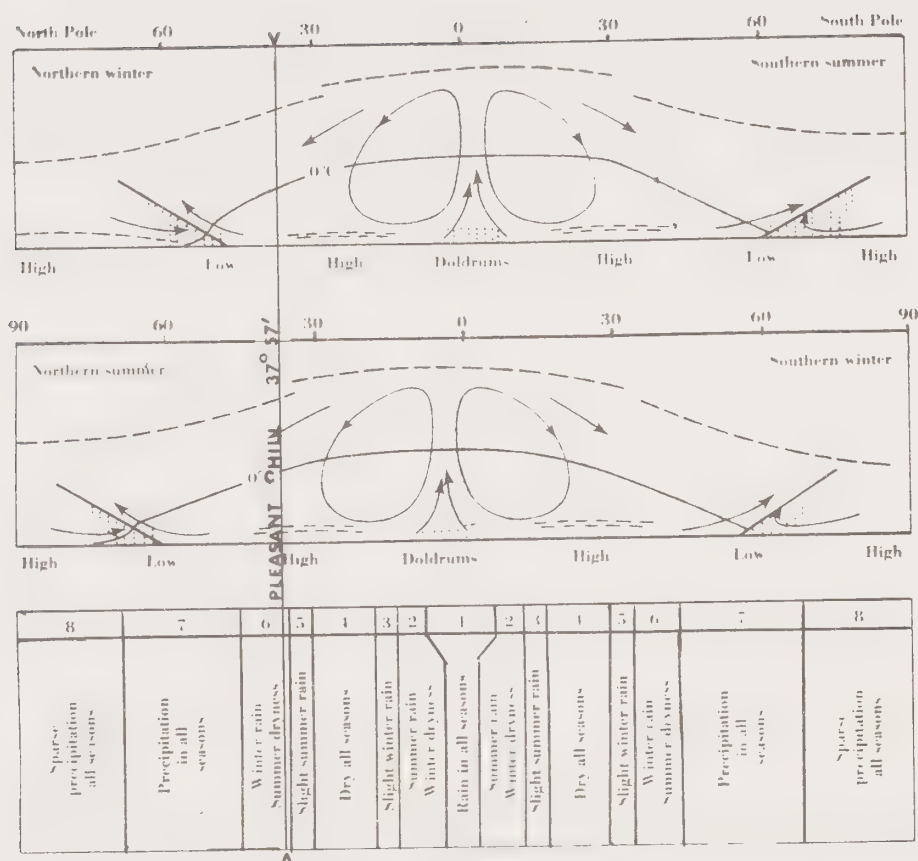


Figure 1. Schematic Cross-section through the atmosphere showing the principle regions of ascending and descending motions and the main zones of precipitation.

EROSION AND CONSERVATION CONSIDERATIONS

Comparable rain/erosion data is not available in Pleasant Hill due to the difficulties and expenses involved for attending simultaneous measurements in storm water inlets and sewers. Nevertheless, conclusions may still be made concerning erosion; "where high intensity storms occur on watershed, rates of gross erosion are high".⁶ Inasmuch as we cannot alleviate silta-tion (deposition of erosion products) entirely, we must appreciate weather conditions (most of which are seasonably predictable for this area) and their relationship to potential flood hazards in Pleasant Hill.

6. Handbook of Applied Hydrology, a compendium of Water Resources Technology, Ven Te Chow, PhD., Editor, McGraw-Hill, New York. 1964

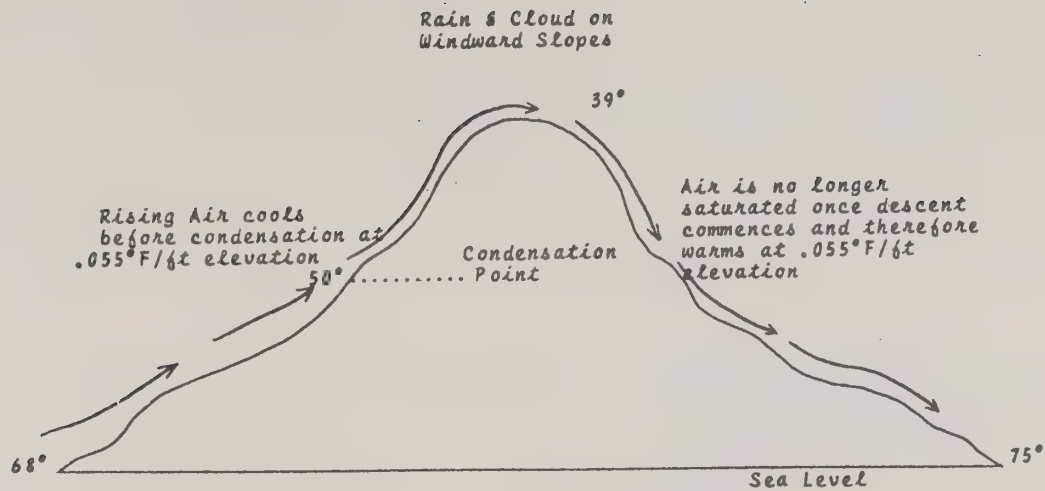


Figure 2. Condensation on a typical west coast hillside.

For example, the practice of hillside excavation during the rainy season is not permitted within Pleasant Hill's planning jurisdiction. Unfortunately, this does not cover areas upstream from Pleasant Hill. Because upstream development effects Pleasant Hill's flood control situation, the Public Works Department of Pleasant Hill is seeking the formation of a combined flood assessment district with Walnut Creek and the County. This would allow the jurisdictions concerned direct control over their own particular flood situations.

HYDROLOGY AND HILLSIDE DEVELOPMENT

Developed parcels, roads and buildings all hinder natural ground water absorption by merely being over the ground that would normally absorb rainfall. Greatly accelerated erosion and sedimentation have resulted from conversion of a typical small watershed from its original state to urban development. . .; such accelerated sedimentation clogs storm drains, causes increased flooding and generally detracts from the quality of the environment. Pleasant Hill's position to the leeward side of the hills, in from the coast, climatologically dictates that most rainstorms will be leaving more rain on the Pleasant Hill hillsides than in the already developed valley sections. Despite the fact that a good drainage system would carry off most water that would normally be absorbed by surrounding soils, such drainage, coming from a heavily developed area would be a great strain on Pleasant Hill's present flood control channel. The 100-year flood plain map drawn by the Corps of Engineers is not applicable in pre-

dicting water levels in this situation, as new development brings more undesired run-off than in previous years, raising stream beds and thusly making previous flood plan maps obsolete.

WALNUT CREEK WATERSHED PROJECT

CONTRA COSTA SOIL CONSERVATION DISTRICT, CALIFORNIA

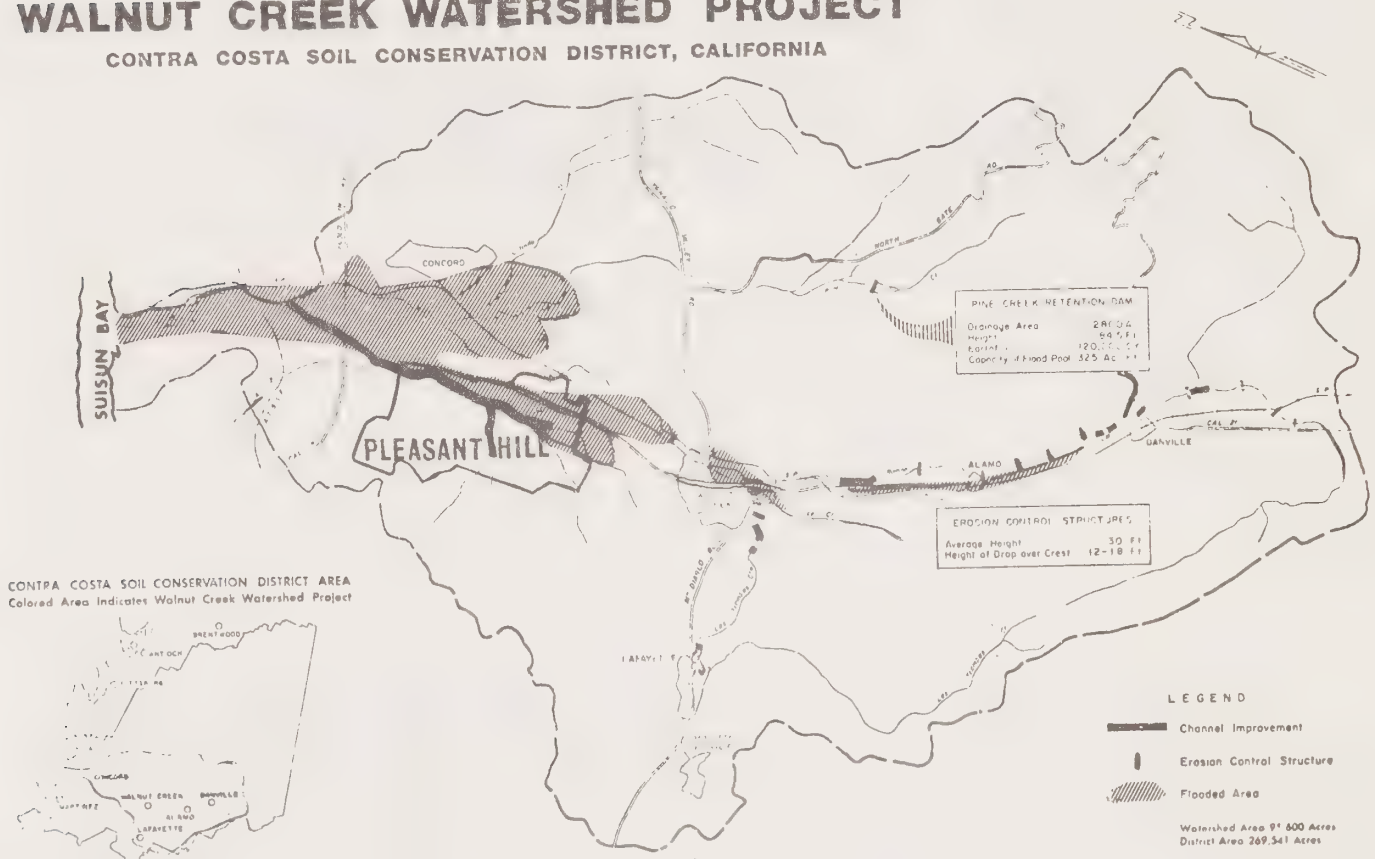


Figure 3. From the Walnut Creek Watershed Story

The Flood Control District, in their efforts to predict and control flooding conditions, has observed and charted developed along local streams and flood control channels. By doing so, they are able to predict increased water flow and hazardous conditions. Should dangerous conditions exist or be created, the Flood Control District may then take the appropriate steps, heightening of banks, widening of channels, etc., to alleviate any such danger.

In addition to the problems of drainage that will be brought up by future development in Pleasant Hill, the Flood Control District and the Corps of Engineers also have the responsibility of monitoring sedimentation brought into the flood control channel by neighboring Walnut Creek. (Such findings are used to draw flood plain maps for building and insurance purposes). Walnut Creek has not as yet realized its point of maximum development, having much more developable land whose future development will cause additional water run-off problems in downstream Pleasant Hill. As Pleasant Hill and Walnut Creek both share the same flood control channel, all jurisdictions involved should consider the responsibilities related to such develop-

ment.

When the City receives a request for a building permit, the increased flooding potential is evaluated by (1) soils and grading reports for small projects, and (2) Environmental Impact Reports for major developments. Major impacts are reviewed by the Community Planning Department, Department of Public Works and the Contra Costa County Flood Control and Water Conservation District. Should any adverse conditions be created, as a result of the proposed development, the request for a building permit is postponed until such time as the developer can show, to the satisfaction of the reviewing bodies involved, that such steps will be taken to mitigate the hazard.

The responsibility of laying sewer and plumbing lines to connect with public facilities is that of the developer. Public facilities now have the capacity to accommodate projected growth in the valley for many years to come. However, increasing development of hillside watersheds can rapidly overload present facilities with high run-off and associated siltation. Hydrologic problems are particularly severe in hillside areas of the City because the natural tendency for greater erosion (with subsequent downstream siltation) is augmented by higher amounts of rainfall than in valleys.

Where high-intensity storms occur on watersheds, at a time when cover conditions offer minimum protection against erosion, rates of gross erosion are high. Because of this, the practice of hillside excavation is not permitted during the rainy season within Pleasant Hill.

Despite the amenities of vegetation grown in Grayson Creek, the Public Works Department assesses their presence to be a flood safety hazard and, therefore, proposes their removal to ease the flood flow of water and siltation. Additional siltation would only cause additional vegetation to abound which, if not removed, would raise the water level of the stream and could result in flooding. Presently, and in the future, all agencies involved with the evaluation of environmental impact statements will coordinate their efforts in evaluation and mapping of potential of flood hazards.

EXCAVATION AND HILLSIDE DEVELOPMENT POLICY - MITIGATION

In recognition of the problems related to hillside development, the City of Pleasant Hill has adopted a Hillside Development Policy. The community realizes that development of the hillsides will take place, and therefore deemed necessary a policy to insure desirable development in conformance with Chapter 70 of the Uniform Building Code.

The reasons for the adoption of the Hillside Development Policy not only concern themselves with erosion, siltation and water run-off, but also relate to the physical conditions of the City as a whole. The following were all considered as being reasonable assumptions and are the foundation of the Resolution establishing the Hillside Development Policy in the City of

Pleasant Hill:

- a. Due to the physical dominance of the City's landscape, whatever is done to the hills seriously effects the visual character of the community.
- b. A desirable visual identity of the City can be preserved and enhanced through protection of its most prominent landmarks.
- c. The hill areas are an integral part of the total City environment, for they constitute a large part of the natural open space and scenic resources.
- d. There are special attractions inherent in the hill areas such as variety of topography, rugged natural terrain and their dominance of the total City, including the City's namesake.
- e. Hill area development requires special attention to the provision and maintenance of public utilities and facilities and safety to human life and property.

AIR QUALITY

Despite increased pollution and smog prevention measures adopted and proposed by Federal, State, and Regional Agencies, air quality in the City of Pleasant Hill has continued to decline because of the increased population of automobiles. Interstate 680, a major connecting link between Sacramento and San Jose runs directly through the eastern side of Pleasant Hill. Housing projects presently approved and under construction tend to indicate that the City will not be able to meet the 1977 air quality standards established by the Federal Clean Air Act of 1969, unless dynamic changes are instituted for automobile exhaust systems or the automotive industry offers viable alternatives to the combustion engine.

According to a recent Contra Costa County traffic study, the average number of round-trip automobile rides from the average household has increased considerably over the last four years. At the time of this writing, it is not yet known whether the present gasoline shortage has decreased the number of automobile trips in Pleasant Hill.

Another problem to the Planning Area is the prevailing sea breezes. Such winds normally carry industrial and auto pollution to the Diablo Valley. These external pollutants are augmented by local automotive pollutants from local traffic as well as by through-traffic on Interstate 680. Such pollutants tend to be trapped in the Diablo Valley because of local topography and a common inversion layer.

TOPOGRAPHY AND AIR POLLUTION

"Topographically, the Bay Area resembles an irregular shallow bowl surrounded by hills, ideal for trapping and holding air pollution. It is also subject to periodic temperature inversions; layers of warm air which act to hold cooler, pollutant-laden air close to the ground."⁷

Within this bowl-shaped topography, air contaminants are emitted at a fairly constant rate throughout the year. Basically, the Diablo Valley's weather is determined in the interplay of the high and low pressure areas and the continental and maritime air masses. The Pacific air mass is more moist, denser, and less given to temperature extremes. These two air masses constantly interchange back and forth across the area, one being predominant and then the other, thereby creating our changes in weather. The amount of air available to dilute pollutants depends upon the region's over-all weather pattern, primarily the character of the inversion layer and the amount of wind flow.

The sighting of a dirty, yellow-brown line across the sky indicates the height of an inversion layer. Because of the hills and the inversions, there has always been a potential for air pollution in the Diablo Valley. With the impending increase in population, the air pollution potential will eventually develop into a more serious problem than it is now.

The inversion layer is warmer than air immediately below it. It is simply a reversal of the normal decrease of temperature with altitude. Inversions are naturally formed on the west coast of any continent by subsidence which

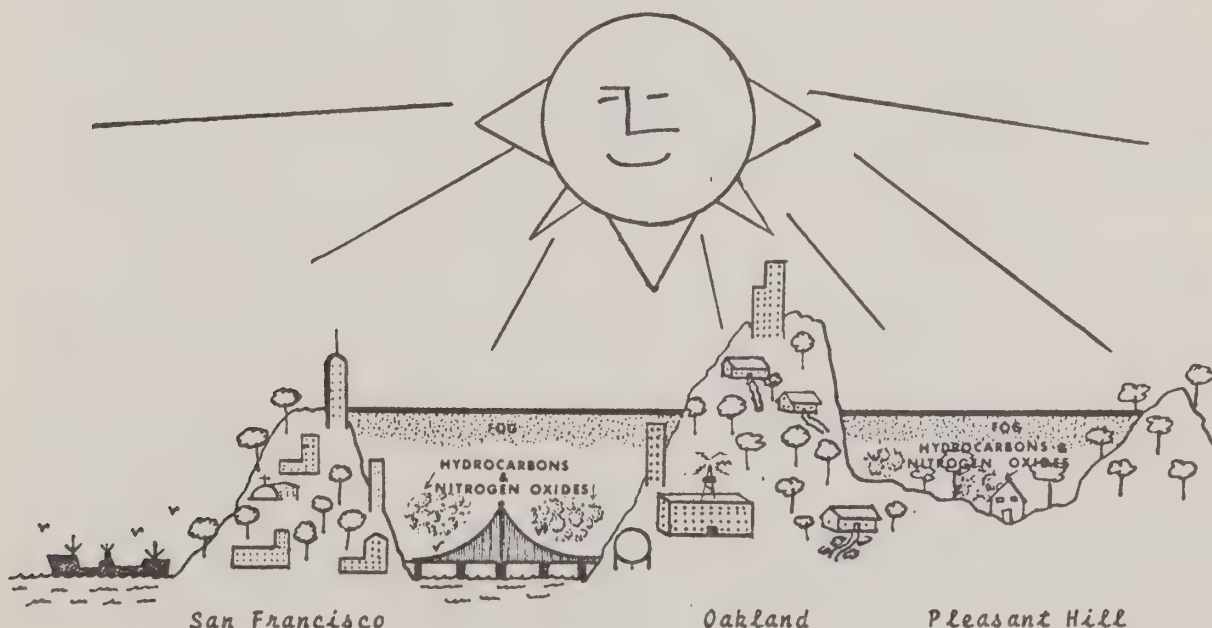


Figure 4. Day without photochemical smog.

7. Air Pollution and the San Francisco Bay Area, Seventh Edition, Bay Area Air Pollution Control District, 1972.

compresses and heats air, or by solar action which warms the upper layers of the atmosphere early in the morning, particularly in valleys. Normally the Bay Area has temperature inversions about two out of every three days.⁸ Sunlight is necessary for photochemical smog. On foggy or cloudy summer days, hydrocarbons and other organic materials that are trapped below the normally-occurring inversion layer are not exposed to sufficient ultra-violet rays to produce photochemical smog.

In terms of air pollution, the most imposing consequence of a temperature inversion is its ability to act as a barrier to prevent pollutants from rising and being diluted vertically.⁹ Colder air cannot rise through warmer air and pollutants trapped next to the ground are "encased" and held by these inversions; sort of an air pollution embolism. The height of the inversion layer can vary widely from day-to-day, thereby increasing contaminants. When the inversion layer is lower than the hills surrounding it, it becomes a lid, sealing the low-lying, pollutant-laden air into a basin. (Please see Figure 5 below).

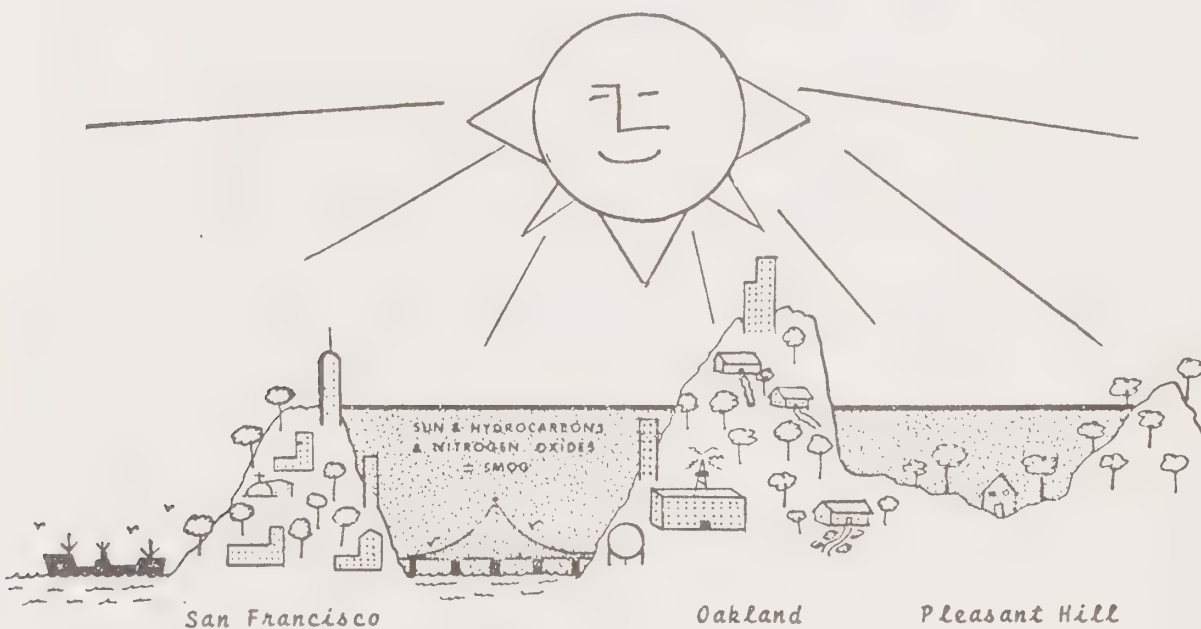


Figure 5. Smog: On days when there is no cloud cover, this reaction will take place.

The East Bay Basin is bounded on the west by the Berkeley-Oakland Hills and their southward extensions. On the north, by the Suisun Bay, and on the south and east by the boundary lines of Alameda and Contra Costa Counties.

8. *ibid* p.9

9. *ibid* p.9

This basin includes transitional zones which can share some meteorological relationship with the San Joaquin Valley.¹⁰ The wind regimes at Buchanan Field in Concord indicate terrain-induced winds with 45.5 percent of all wind conditions, including calm, being southerly. Excluding calm, 67.4 percent of all wind movement is in a southerly direction.

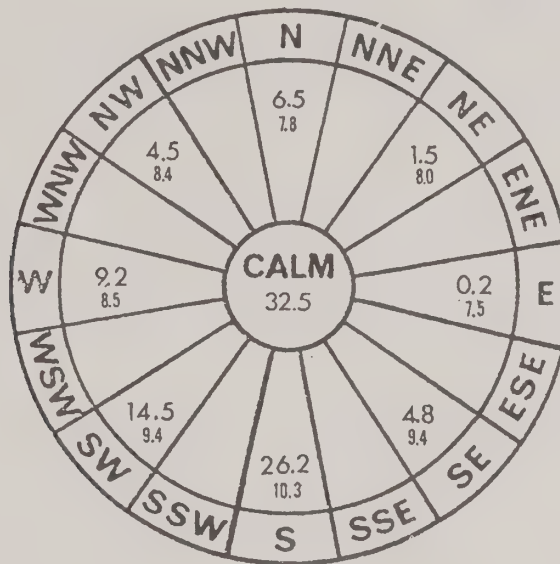


Figure 6. Percentage of Distribution of Wind Directions with Mean Wind Speeds Indicated Beneath. Readings from Buchanan Field Weather Station Location - 37° 57' north, 122° 3' west.

Emphasis on southerly winds is indicated here as Pleasant Hill is the recipient of a sizeable portion of air pollution from its immediate industrial north. (Please see Table 2). In addition to this, winds carry much of San Francisco's and Oakland's pollution north to Suisun Bay. Some of these contaminants are eventually carried south to Pleasant Hill. Although Pleasant Hill produces no industrial pollution, it receives pollution from the nearby sources via the wind regimes.

For a more detailed examination of area wind regimes, please consult Aviation Affects on Air Quality, San Francisco Bay Region of the Association of Bay Area Governments, ABAG, 1971. Figures VII-3 thru VII-19.

The pollution potential of the Diablo Valley is very high. Surrounding elevated terrain in conjunction with temperature inversions frequently make a closed box of the valley which pollutants may quickly reach high levels during periods of low wind speed. Abundant sunshine and warm temperatures in summer are ideal conditions for the formation of photochemical conditions. The Diablo Valley is the frequent scene of photochemical pollution, even in the absence of local sources. This is due to sea breeze transport of contaminants from western urban areas to the Suisun where northerly winds can carry this pollution southward, as well as westerly winds can carry San Francisco's and Oakland's pollution to the Diablo Valley.

10. Aviation Affects on Air Quality, San Francisco Bay Region, Association of Bay Area Governments, 1971. Page IX-10

PHOTOCHEMICAL SMOG:*

Photochemical air pollution or photochemical smog is a relatively new kind of air pollution which scientists have only recently begun to understand. It results from the chemical reaction which takes place in the atmosphere between NO₂ and organic compounds under the catalytic affect of sunshine; hence, the label "photochemical".

Ideal conditions occur in the fall on warm, windless days which is when the greatest amount of photochemical smog exists. The major detrimental affects of photochemical oxidants are visibility reduction, destruction of vegetation and eye irritation. Photochemical smog was first identified in California, but today it is found in most major cities of the world wherever there are large concentrations of people and automobiles.¹¹

The prime origin of gases that trigger photochemical smog is the automobile. In the Bay Area, about 57 percent of reactive organic gases and 67 percent of nitrogen oxides come from automobiles, trucks and buses.¹² The State's automobile control program has already succeeded in making a substantial reduction, with more progress indicated as controls become more stringent. Another major source, the burning of rubbish and prunings by Bay Area residents, was halted by legislation of 1970. For an up-to-date listing of controls, please refer to Laws Establishing and Affecting the Bay Area Air Pollution Control District, revised May 1, 1973, available from the Bay Area Air Pollution Control District, 939 Ellis Street, San Francisco, Ca. 94109.

THE FUTURE

The Board of Directors of the Bay Area Air Pollution Control Board has indicated that the Air Pollution Control District's fundamental goal is to "attain the air quality standards as set forth by the State Air Resources Bureau and the Federal Government".¹³ No doubt more stringent controls are to come from this, both on private and commercial pollution. The City of Pleasant Hill recognizes the difficult planning and legislative procedures encountered by the Bay Area Air Pollution Control Board and endorses their efforts in keeping the Bay Area a clean place to breath.

* The largest percentage of photochemical smog is ozone O₃. Other substances include nitrogen dioxide and peroxyacetylnitrate (PAN).

11. Air Pollution and the San Francisco Bay Area, Bay Area Air Pollution Control District, San Francisco. p. 7

12. *ibid* p.7

13. *ibid* p.33

Table 2. Daily Industrial Air Pollution in
Tons. Major Polluters* - Richmond,
Martinez and Antioch¹⁴

Particles	11.5 tons
Organics	63.6 tons
Nitrogen Oxides	87.4 tons
Sulphur Oxides	110.6 tons
Carbonmonoxide	49.3 tons

Should industry be allowed to burn less expensive high-sulphur coal in place of scarce low-sulphur fuel or natural gas, the above results would be multiplied. This, along with the combination of related factors, has caused Pleasant Hill and other Bay Area communities to examine limitation of the number and use of automobiles in the Bay Area.

For oxidant and nitrogen dioxide, "max" is highest hourly average value expressed in parts per million. For carbon monoxide "max" is highest 12-hour average value in parts per million. (The one-hour standard for CO was never exceeded during the year.) For sulfur dioxide, "max" is highest 24-hour average value expressed in parts per million. For suspended particulates, "mean" is the annual geometric mean in micrograms per cubic meter.

Stations	Oxidant		Carbon Monoxide		Nitrogen Dioxide		Sulphur Dioxide		Suspended Particulates	
	Max.	*	Max.	*	Max.	*	Max.	+	Mean	++
San Francisco	.19	2	11	3	.27	1	.033	0	47	2.0
San Rafael	.18	9	8	0	.12	0	.012	0	46	3.8
Richmond	.28	7	13	1	.19	0	.043	0.4	44	0.6
Pittsburg	.20	23	6	0	.15	0	.031	0	41	5.1
PLEASANT HILL**	.23	36	-	-	-	-	-	-	-	-
Oakland	.31	10	11	2	.25	1	-	-	-	-
San Leandro	.36	21	-	-	-	-	-	-	-	-
Fremont	.33	45	9	0	-	-	.007	0	58	11.2
Livermore	.23	52	8	0	.19	0	.006	0	70	15.5
San Jose	.15	14	14	12	.24	0	.006	0	77	25.3
Redwood City	.28	17	7	0	.20	0	.012	0	32	1.9
Burlingame	.17	5	10	1	-	-	.015	0	59	12.9
Petaluma	.12	6	-	-	-	-	-	-	-	-
Napa	.14	9	9	0	-	-	-	-	-	-
Vallejo	.19	11	13	6	-	-	-	-	-	-
Fairfield	.18	12	-	-	-	-	-	-	-	-

* Number of days ambient air quality standard was exceeded.

** Pollution Station at Contra Costa Consolidated Fire District, 2010 Geary Road, Pleasant Hill.

+ Percent of observed days when ambient air quality standard was exceeded.

++ Percent of observed days when ambient air quality standard for 24 hours (100 ug/m³) was exceeded.

Table 3. Air Pollution in the Bay Area
by Station, 1971¹⁵

* This list indicates a summation of only industries that produce more than 1/10th ton per day or more of the listed pollutants in the specified geographical areas. True figures are slightly higher.

14. ibid pp. 35-36, 1971 data

15. ibid p. 39 (Notes ambient air in any air not confined by four walls and a roof; outside air)

Alternatives to automotive transport are actively being sought by Pleasant Hill and also through its association with the Local Mass Transit Authority of Contra Costa County. The Local Mass Transit Authority and the Transportation and Circulation Committee of the General Plan Review Committee are both actively seeking viable alternatives to the automobile congestion/pollution problems that presently exist, as well as to be planning for transportation needs in the future. These studies, as well as other future studies, will be coordinated with the efforts of the Planning Department of the Bay Area Air Pollution Control Board.

The most evident detriment to air pollution is undoubtedly the automobile. Even with the present gasoline crisis, the last few year's trends in Pleasant Hill have indicated that vehicle ownership is rising at a faster rate than is the population. Some of their pollutants can be reduced by installation of pollution prevention devices on automobiles, trucks, busses and airplanes. Nevertheless, pollution readings across the country indicate the direct correlation between population density and air pollution; the cause, of course, is automobile ownership and operation.

This simply cannot be legislated against, but the City of Pleasant Hill can elect to keep its population density (presently 9.4 people per acre, for developed parcels) at a low level for future development. At the time of this writing, approximately 20% of the land originally zoned as "multiple" remains undeveloped. No additional parcels are being considered for multiple zoning at this time, and all efforts are made to keep Pleasant Hill's population densities low. No doubt newcomers to Pleasant Hill will cause additional pollution, but by maintaining a low-density community, pollution may, at least, be kept at a minimum.

Pleasant Hill's western hilly boundary is covered with many kinds of trees and vegetation, all of which, in a small way, filter impurities from the air. As contaminated air blows through the leaves, impurities adhere, eventually falling to the ground, passing the partially filtered air into Pleasant Hill's breathing space. The need to retain these trees, not only for the reason listed above, but also for aesthetic groundcover and animal refuge reasons, is more fully covered later in the discussion of conservation issues.

The City of Pleasant Hill recognizes the problems of dangers of unchecked abuse of air as it relates to contamination. Pleasant Hill, under the jurisdiction of the Bay Area Air Pollution Control Board, is examining means by which air pollution may be reduced, not only in terms of present-day pollution, but also in terms of future populations, with their accompanying motor vehicles, migrating to Pleasant Hill.

FLORA AND FAUNA

Pleasant Hill is fortunate in having many interesting and beautiful varieties of plants and animals. This natural beauty is becoming more and more difficult for the urban dweller to view and appreciate. Presently, Pleasant Hill's land is approaching full development and development is now going up into the hillsides, threatening the loss of many of Pleasant Hill's natural amenities.

Fortunately, Pleasant Hill does not have to be concerned, at present, about its natural resources being methodically depleted or mined or having any major alteration of organisms so as to change the chemical environment, i.e. sewage and oxygen concentrations of nearby lake water, chemical refuse and waterways, etc.

Through Parkland Dedication and open space allocations, Pleasant Hill will hopefully be able to preserve many of its resources. Many natural amenities, such as trees, birds and assorted wildlife need special protective measures, many of which are provided for by State and local conservation ordinances. Proper zoning, land use controls and ordinances can do much to preserve a developing area's natural surroundings.

THE WILDLIFE AND TREES

Historically, the Contra Costa Valley has a very interesting floral and faunal background. Many years ago, Bison and even Mastodons roamed freely over what is now Monument Boulevard. Climates changed, mountains formed and the Miwok, Wintun and Castanoan tribes ruled a peaceful San Francisco Bay Area. The first White men to see the beautiful redwood forest that abounded throughout the Diablo Valley were members of the Juan Bautista De Anza expedition in 1776. All of their reports of the entire Bay Area proclaimed the beauty that nature had developed.

All was fine for another 64 years, until 1840, when two deserting British seaman-turned-lumbermen cut the, then, giant forest and hauled the timber north to sell to John Sutter for his Sacramento Fort. These forests were on two giant land grants of Luis Peralta (granted 1820) and Joaquin Moraga (granted 1841). The British trespassers started the lumbering era that left the Diablo Valley void of the beautiful redwoods and exhausted the magnificent forest by 1859, leaving a vast acreage of stumps.

A present-day arboreal problem now exists with the seemingly pleasant Eucalyptus forests now in Pleasant Hill and the surrounding areas. Introduction of the Eucalyptus trees from far-off Australia had been done in the 19th Century. It was not until between 1910 and 1913 that mass plantings of these trees created a major change in the East Bay Region's ecology.

Formally, the Bay Area had been open grassland with only native trees. The tall, fast-growing Eucalyptus trees were then imported as seedlings, without the fungi, beetles and mulching organisms which maintain the balance of nature in their native Australia. As a result, dead leaves, bark and branches that form a natural mulch for the Eucalyptus' surrounding shrubbery in Australia; in the East Bay, however, plants at the base of Eucalyptus trees are covered with dead leaves, bark and branches that often kill off much of the surrounding groundcover, making the land much more susceptible to erosion. The native Eucalyptus fungi, beetles and mulching organisms cannot act on them, as they are not indigenous to the United States.

In December of 1972, an estimated 2,000,000 Eucalyptus trees were killed by record cold weather, creating an enormous fire hazard. The oil-soaked leaves stayed in place on the tall trees and wouldn't blow or fall off. City, Regional and State governments had declared a state of "local emergency" in the Berkeley Hills. The Federal Government had declared that a state of "eminent disaster" existed; there had been numerous warnings of fires for urbanized areas which could be decimated by dry east winds.¹⁶

Despite the pleasing olfactory sensations of driving, cycling or walking through the East Bay Eucalyptus forests, conservationists now have the insight of the negative attributes inherent in planting such forests. These negative attributes, when weighed against the positive attributes of these beautiful trees, tells the conservationist that considerations other than those which are aesthetic have to be made when experimenting with nature.

Today, Federal, State and private agricultural services are experimenting with all types of vegetation from fire-retardant grasses to more insect-resistant tree sprays without the use of DDT. If carefully planned, man's experimentations in agriculture can produce a more harmonious relationship between himself, birds and the bees.

16. Birds May Flock to Hills When (Eucalyptus Trees are Cleared), Article - Oakland Tribune, June 3, 1973.

PLEASANT HILL'S HERITAGE TREES

The City of Pleasant Hill is in an area which originally contained many large and majestic trees. In the course of development of land, many of these original trees were destroyed. It is recognized that the preservation of trees enhances the natural scenic beauty, increases property values, encourages quality development, and helps to maintain the ecology of the area, aids in tempering the effect of extreme temperatures, improves the attractiveness of the City to visitors, and gives the City an identity and quality which encourages economic activity and contributes to the tax base, and increases oxygen output of the area which is needed to combat air pollution.

For these reasons, the City Council of Pleasant Hill believed that the establishment of a heritage tree program would promote the public health, safety and welfare of the City, while recognizing the rights of individuals to develop private property in a manner not prejudicial to the public interest. The heritage tree is defined as a tree or a group of trees exhibiting one or more of the following characteristics:

- 1) it has historical significance or has taken on an aura of historical appeal; or
- 2) is mutually dependent upon each other for survival;
or
- 3) is considered an outstanding specimen of its species;
or
- 4) has a diameter of at least 16 inches at any point higher than 2 feet above natural grade, and with the consent of the property owner has been so designated as a "heritage tree" or "trees" by the City Council of the City of Pleasant Hill.

In order to facilitate such a program, the City Council of Pleasant Hill has decided that a canvas of the City be made to locate trees to be considered for enrollment in the heritage tree program. The City will make public notice of the program and invite owners to enroll trees or tree groupings into the program. The City of Pleasant Hill will send notices of the program to those property owners of trees found by the canvas and invite them to enroll their tree or tree grouping into the program. Such a program should save all enlisted trees from cutting by future landowners.

BIRDS

Birds are, by far, the most common animal found in the Pleasant Hill area. Although these beautiful creatures are in apparent abundance, their migra-

tory patterns and nesting characteristics are widely varied amongst the different species. Local residents are very fortunate in being able to have several hundred species of resident migratory birds.

Presently, the clearing of the frost-killed Eucalyptus trees, from the freeze of December 10, 1972, in the Oakland-Berkeley hills, is increasing the bird population of the Diablo Valley. Mr. Paul Covell, Oakland Park Naturalist and Chairman of the local Audubon Society Newsletter, the "Gull", stated that Diablo Valley area bird watchers can expect exciting future changes in resident and migratory bird population; "So few were the bird species inhabiting the Eucalyptus forests, that. . .this great clearing will result in a gradual increase in both species and numbers of birds".



Through proper preservation of trees, parks and open spaces, Pleasant Hill can maintain its refuge for its resident and migratory bird population. Homeowners have the option of planting trees and/or plants that will either attract or repel birds, depending upon whether they're considered desirable or not.

Should any endangered bird species, such as the Peregrine Falcon, California Yellow-Billed Cuckoo or the Clapperrail, be found to be niched in Pleasant Hill's open spaces, special preservation considerations will have to be made at that time to assure their safety. All Federal and State Conservation and Wildlife protection laws will be strictly adhered to.

OTHER SPECIES

The streams of Pleasant Hill are sometimes inhabited by varying breeds of spawning fish from Steelhead to Salmon. These fish, as well as many

other resident Blue Gills, Sunfish, fresh water Clams, Crayfish, aquatic insects, protozoa, etc., depend upon Pleasant Hill's keeping its waterways clean.

Many other species live within the planning jurisdictions of the City of Pleasant Hill and it is the function of the City to maintain as many possible habitats as is feasible (please see recommendations and suggestions).

ENVIRONMENTAL DESIGN

Many natural resources have been lost or impaired over the years as a result of overlooked or unchecked abuses during property development. To check this abuse, the California State Legislature, in 1970, enacted the California Environmental Quality Act which required that all State agencies and local government prepare an environmental impact report on "any project they intend to carry out which may have a significant effect on the environment".

In 1972, the case of Friends of Mammoth vs. Mono County, the California Supreme Court rules that this language applied to governmental actions such as the issuance of permits. The California State Supreme Court refused to grant a moratorium on the effect of the decision and declared that this ruling applied to permits issued before its decision. Faced with confusion at the local level as to the proper way to implement the decision, and hysteria within the construction industry, the Legislature enacted significant amendments to the California Environmental Quality Act, designed to postpone the effect of the Friends of Mammoth decision, and partially restrict the operation of the act as it had been interpreted by the State Supreme Court.

The CEQA now applies to "discretionary projects proposed to be carried out or approved by public agencies, including, but not limited to, the enactment and amendment of Zoning Ordinances, the issuance of zoning variances, issuance of conditional use permits and the approval of tentative subdivision maps," but does not apply to non-discretionary "ministerial projects". An environmental impact report must be prepared for any discretionary project "which may have a significant effect on the environment".

An exception from the impact reporting requirements, which had existed in the original act for projects carried out or approved by cities and counties which have adopted a conservation element to the General Plan, was deleted by the amendments. The phrase "significant affect on the environment" has also been defined by amendments to cover the situations where any of the following conditions exist:

- a. A proposed project has the potential to degrade the quality of the environment, curtail the range of the environment, or to achieve short-term goals to the disadvantage of long-term, environmental goals;

- b. The possible effects of a project are individually limited, but cumulatively considerable;
- c. The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly.

The environmental impact report must contain the following as being specified in the original act:

- a. The environmental impact of the proposed action.
- b. Any adverse environmental effects which could not be avoided if the proposal is implemented.
- c. Litigation measures proposed to minimize the impact.
- d. Alternatives to the proposed action.
- e. The relationship between local, short-term uses of man's environment and the maintenance and enhancement of long-term productivity.
- f. Any irreversible environmental changes which would be involved in the proposed action should it be implemented.
- g. The growth-inducing impact of the proposed action.

When major development projects are submitted to the City for review, the Staff reviews all of the relevant aspects of environmental design. It is the interpretative policy of the City to evaluate all such Environmental Impact Reports (EIR's) and suggest necessary changes for alleviating undue environmental burdens or losses.

The basic function, herein, is to provide a bridge between the long-range environmental development policies in the General Plan and land development by means of such tools as open space, parks, zoning and subdivision ordinances. Such designs must also provide a well-formulated framework by which the City of Pleasant Hill can move towards a more satisfactory and efficient landform within its planning jurisdiction. At the same time, it must provide for preservation and enhancement of the natural and man-made environment, as well as the small City, single-family, atmosphere enjoyed by the residents of Pleasant Hill.

Natural boundaries, such as the Briones Hills to the west, open space and streams must be included in their entirety to influence the form and extent of the environmental design for Pleasant Hill's urban area. Hence, environmental design plans must clearly guide development decisions, establishing a level of guidance to both public and private development sectors.

Within the limits of flexibility provided, the Planning Department, Architectural Review Commission, Planning Commission and City Council

shall therefore exercise environmental discretion in community design. In areas of question, the City Council of Pleasant Hill shall decide whether or not any given project is in accordance with the conservation element.

Environmental design not only includes conservation of natural resources, but also conservation of human (man-made) resources such as:

- a. types of dwelling - commercial and retail units needed in Pleasant Hill - Environmental Policy requires that the City seek to maintain the best possible balance between them.
- b. location - a policy of developing adjacent urban expansion as extensions to present development, as opposed to leap-frogging into undeveloped sections within Pleasant Hill's sphere of influence.

Cognizance of such factors being available, as opposed to only a few years ago, when they were not, enables those peripheral to the planning process to more easily understand and remedy difficulties and deficiencies in development. This methodology also offers more control over types and locations of new development. Final development of any project is contingent upon City approval of development plans and building codes. Any detriment foreseen in the project would likely be cause for disapproving the requested building permit until such time as the problem is alleviated.

SUGGESTIONS AND RECOMMENDATIONS

The present conservation and environmental protection programs have been directed primarily towards the most utilitarian control of air quality, water quality, open space, wildlife and related resources. Often, little direction has been given towards relating one or more of these programs with another. Therefore, it is the responsibility of the individual jurisdictions to control their own conservation efforts by coordination of efforts in the above areas. Development in Pleasant Hill is an inevitable factor, but yet, the conservation processes should involve an orderly development to maintain many of the land's natural amenities.

Growth, its direction and quality must be controlled, not only by location and land use, but also by density. The more dense zonings allowed in the City, the more problems inherent with a burgeoning population. In order to direct such growth and maintain genuine concern for ecological ramifications, the plan recommends that the following basic principles for development be adhered to:

- a. That a Planned Unit Development (P.U.D.) approach to conservation maintenance be designed to guide

development of all parcels in Pleasant Hill with special emphasis being given to wooded areas and natural waterways. One of the advantages of clustering housing, when carefully planned, is that natural environmental factors may be preserved and protected from bulldozer pollution by the creation of permanent conservation areas.

The P.U.D. approach, a basically new concept in community design, has given developers a means by which a large area of open space may be allocated to residents for common recreation use without changing the land's original zoning density. It is the belief of the City of Pleasant Hill that "if properly designed and regulated, cluster housing is a reasonable alternative to standard subdivision housing."¹⁷

The merits of such neighborhood design are obvious. For a further discussion of cluster or P.U.D. type-housing, please refer to the Ad-Hoc Cluster Committee Report to the City Council of the City of Pleasant Hill, April 1972.

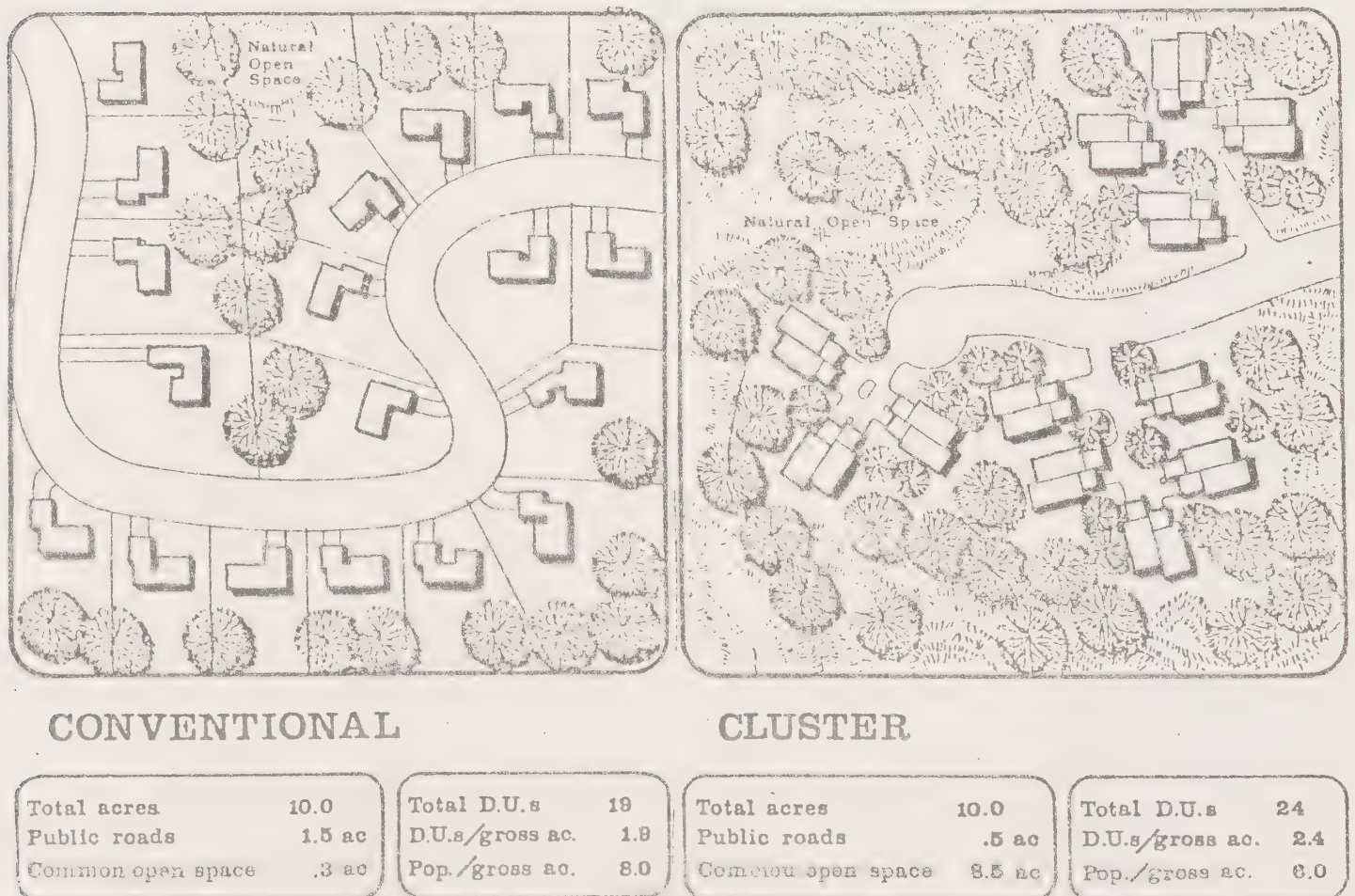


Figure 7. Conventional versus Cluster Housing

17. Ad-Hoc Cluster Committee Report to the City Council, City of Pleasant Hill, April 1972 p.1

- b. The critical wildlife habitats and nature areas whose existence may be imperiled be designated.

Such areas of concern, when made known to public and private sectors in the development process, can be a great aid in maintaining a balance of wildlife in the City's undeveloped areas. When a specie or species have their numbers and/or welfare imperiled by encroaching development, the ramifications become the direct concern of the City in the evaluation processes of the Environmental Impact Report connected with the proposed project.

- c. The mechanisms for balancing environmental and social considerations of land use decisions be provided.

Development, for development's sake, is the natural antithesis of orderly community design. Any individual project proposed for development will have all future conservation ramifications examined and weighed by the City Staff. These evaluations are not only for wildlife, but also for man, whose domain will be the proposed development, if it is developed. Land use decisions allowing intense crowding not only produce the problem of too many people in the same place, at the same time, but also bring problems of deletion of natural reserves, pollution, added expenses of community services, etc.

For every developed parcel, the City has one less parcel of open space. Considerations for the immediate surrounding area, as well as for the entire City have to be evaluated when a site proposal goes to the City for review.

At the time of this writing, Pleasant Hill's planning area has over 2,100 acres of open space, which if developed at a density of 4.5* units per acre, could bring over 30,000 new residents to the City, leaving no open space and only 104 acres of parks to accommodate the entire populace. Clearly, this can not be done as long-range land-use concepts have to be viewed in the context of the entire City's future. For further discussion of open space needs, please refer to the Open Space Element of the General Plan.

- d. That in any given situation of grading, all safety factors shall be taken into consideration and properly reviewed when natural contours are changed, so as to make land suitable for development, the Building Inspector may ask that the respective developer retain a Soils Engineer to submit calculations as to ground stability. When such requests are made by the building official, such plans should be drawn to scale of sufficient clarity to indicate the nature, extent and detail of work proposed.
- e. That all professional planning skills and experience be employed in utilizing and protecting the City's nature areas.

The City will endeavor to evaluate wildlife sanctuaries and areas of ecological concern for reference use in examination of future site proposals. Planning decisions concerning delicate areas will be viewed in light of such evaluations. At this time, viable alternatives to development and/or specific densities may be discussed in a site proposal's review process.

- f. That all workable air pollution controls be incorporated and utilized in protecting the City's air.

* This represents the average present density of dwelling units now in Pleasant Hill.

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